

MISSOURI

resources

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Director's Comment

The Missouri Department of Natural Resources recently released the "State of Missouri's Environment: Trends, Challenges and Achievements." This report takes a detailed and comprehensive look at the quality of Missouri's air; land, water and energy resources, as well as our efforts to protect our historical and cultural resources and to continue to support our state parks. The 2004 State of Missouri's Environment report is available on the department's Web site at www.dnr.mo.gov/doc/pub/1332.pdf. The report also is available on CD or in print versions by calling the department at 1-800-361-4827.

I'm proud of this report; it's full of facts and figures and, I believe, provides an accurate representation of the current quality of our resources. I hope it will also help us focus our efforts on the work that remains to be done. It also highlights the many partnerships that have made these triumphs possible.

Though we tried to be comprehensive in our information gathering, there's one element that simply couldn't be squeezed between the covers: the pleasure that accompanies a lazy afternoon in a canoe on the Gasconade River. Or the joy of watching children splash in the water at Johnson's Shut-Ins State Park. And as hard as we tried, we couldn't include that quiet that settles on a Missouri trout stream on a cold, crisp March morning as fishermen stand in waders, waiting for a nibble. I often describe these moments as "aha" moments.

Though we may have facts, figures, charts and diagrams to represent various studies, nothing can replace that moment when an individual experiences these resources first-hand. It's enough to make you think twice about what you do wish that empty soda can or how you dispose of that paint thinner: In fact, it's enough to change your life.

I encourage you to take time to look through the State of Missouri's Environment report. I believe it will help all of us to make informed deci-

sions. And if you've had your "aha" moment, I hope you'll help a friend, neighbor, relative or co-worker experience Missouri's resources as well.

Speaking of changing your life gives me the opportunity to tell you about some changes at the Department of Natural Resources and for me personally. After 20 years with the agency – the past seven as its director – I am leaving, effective Dec. 31, 2004. Taking my future into my own hands is the best decision for myself, for my family and for the department. I will always have deep personal convictions for Missouri's environmental issues, and the time has come to find a way to affect them from a different perspective.

I've been blessed to be a part of the Department of Natural Resources and all we've accomplished over the past 20 years. I will continue to work to protect Missouri's natural resources, and I know you will as well. Being a Missourian, I know how important quality of life is to all of us. Our quality of life improves when our natural, cultural, historic and energy resources are protected and our economy thrives.

My deepest and most heartfelt thanks to you all for your support. I'm very proud of the work our department has accomplished for Missourians. I wish you all the best — have a very happy and blessed 2005.



Steve Mahfood

Steve Mahfood
Missouri Department of Natural Resources

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Mission Statement

The mission of the Department of Natural Resources is to preserve, protect, restore and enhance Missouri's natural, cultural and energy resources and to inspire their enjoyment and responsible use for present and future generations.

"Integrity and excellence in all we do"

MISSOURI RESOURCES

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by Randall J. Miles

The run from the "burbs" has landed many Missourians right in the middle of a new rural lifestyle. But when it comes to life without a city sewer system, many homeowners – and their property – are unprepared for onsite disposal.

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A Vote for Accountability



Above right: Fourth-graders learned about rivers and the riparian areas that border them during a Big River educational workshop.

Above: The Boonville bridge is raised for river traffic, but it will be spring before barges once again navigate the Missouri River.

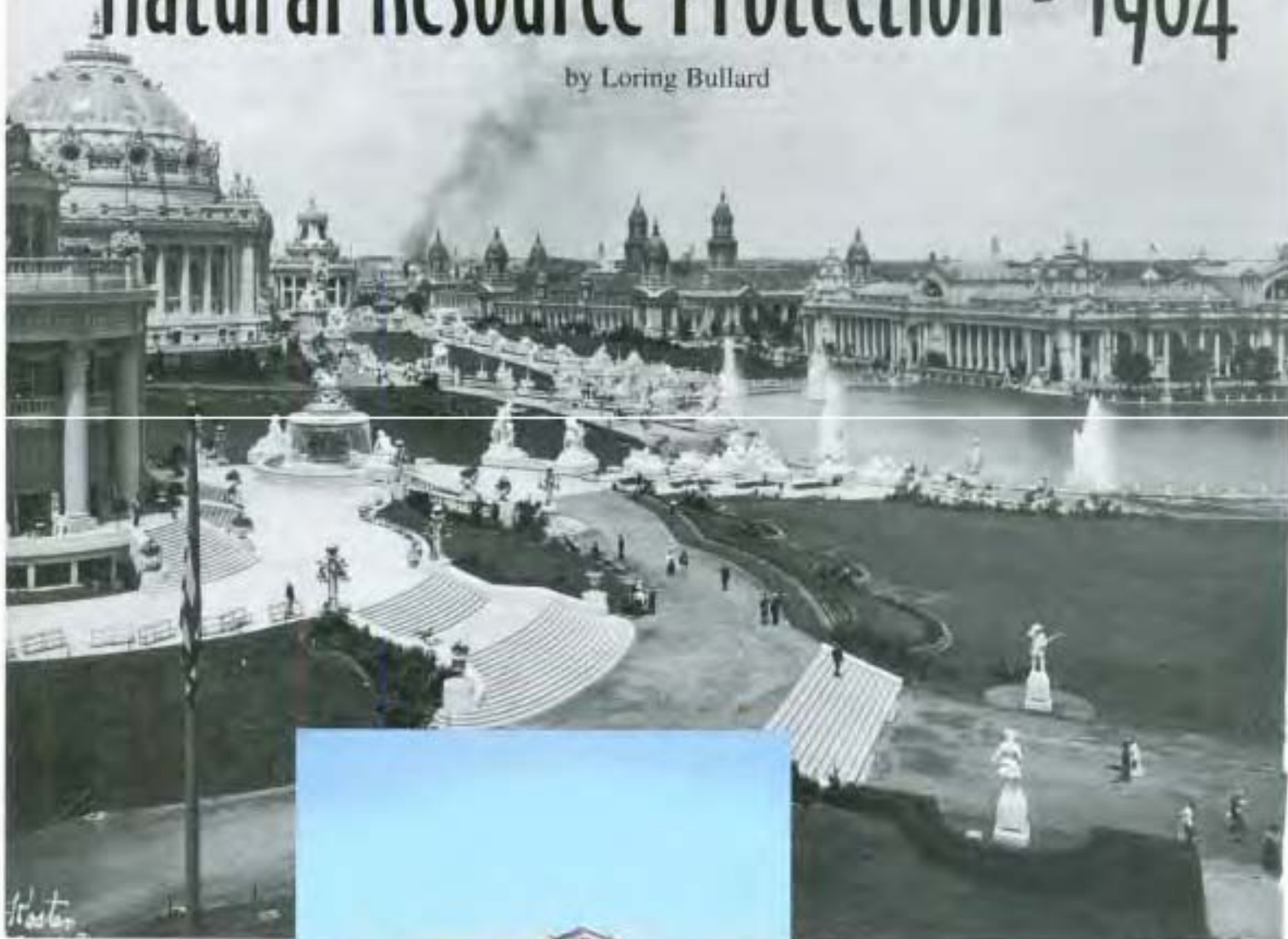
FRONT COVER: Courtney Thompson and Olivia Cavataio plant an oak tree at Edward "Ted" and Pat Jones-Confluence Point State Park.

BACK COVER: Frozen groundwater from a roadside seep is a common winter sight in many parts of Missouri.

Cover photos by Scott Myers.

Natural Resource Protection - 1904

by Loring Bullard



The 1904 Louisiana Purchase Exposition and World's Fair in St. Louis. (Inset) The St. Louis Art Museum, one of the few permanent structures, still stands in Forest Park.

Inset photo by Scott Myers



In 2004, Missourians celebrated the centennial of an amazing feat of exploration launched from their very doorsteps. Lewis and Clark headed west from St. Charles at President Thomas Jefferson's bidding, trekking across the country's largest ever real estate acquisition. Upon their return, these men described a wealth of natural resources just waiting for an eager new nation to put to use in its self-fulfilling prophecy of manifest destiny.

This voracious appetite for resources prevailed a hundred years later, when, in 1904, Missouri celebrated with the Louisiana Purchase Exposition and World's Fair. The intervening century, marked by

unabashed resource extraction with little thought of sustainability, witnessed profound advances in mechanical, industrial, and electrical sciences. America's cutting edge technologies were displayed in St. Louis for the world to admire.

St. Louis also worked to improve its image for the arrival of the fair. It upgraded its water supply, **then**, as now, drawn from the nearby Mississippi River. Fearful that murky **water** might spoil the visual effects of the "**Cascades**" and the fair's other water attractions, city workers installed a newly patented coagulation process to ensure water clarity. However, the city still did not filter its public water supply **and** like many communities at the time, suffered from recurring episodes of waterborne disease.

In 1900, St. Louis health **officials** reported 29 typhoid deaths per 100,000 people. The Exposition Company **chose** to provide an alternative drinking supply for the fair, hauling **train** carloads of water **drawn from** the artesian wells in **nearby De Soto, Mo.** Visitors to the fair could get a cup of this water for a penny from a machine.

Cities fretted about clean drinking water supplies, but **lacked** the **motivation** to clean up

cern by locating drinking water intakes as far as possible from sources of pollution.

Apparently, urban dwellers worried more about smoky skies smudging their coal-burning industrial and residential **neighborhoods** than about water pollution. Word that the World's Fair would be held in St. Louis stimulated a major smoke abatement movement there. This initiative had more to do with the city's image, however, than with concerns over public health. And the energy hungry fair itself devoured over 500 tons of coal every day, which must have added to the haze.

Extraction of coal and other raw **materials** created its own set of problems. In Jan-

(Below) From the mid 1890s until 1909, the Missouri Lumber and Mining Company produced more than 80 million board feet of lumber a year at their **Grandin Mill** in Ozark County.



In 1900, St. Louis health officials reported 29 typhoid deaths per 100,000 people.

local industrial and **sewage** pollution. Both Kansas City and St. Louis discharged their sewers to large rivers, and neither city had significant wastewater **treatment** facilities until the second half of the 20th century. In 1906, a scientist with the United States Geological **Survey** commented on the slow rise of an "effective public sentiment" against the pollution of rivers, **lakes** and harbors. Some cities reacted to public con-

cern in January 1904, an explosion at a mine in Pennsylvania entombed 150 coal miners, an all-too-common tragedy. Spoils and tailings from open-pit coal mining and ore processing piled up at sites across Missouri. Yet, few people decried the leftover wastelands or demanded land reclamation. In April 1904, a reporter visiting a lead smelter in the tri-state mining district (including southwest Missouri) noted large

cloth bags hanging from the ceiling, a simple air filtering system. Incredibly, the company was reclaiming this material – 80 percent lead – only because it had economic value, not as a means to prevent air pollution from the blue, sooty dust.

Inevitably, a host of degradations beset Missouri's streams. Massive efforts to drain the "swamps" of the **Bootheel** moved forward in the early 20th century and politicians misguidedly espoused the straightening of rivers as necessary for flood prevention. In March 1904, for example, Missouri politicians petitioned Congress for \$1.4 million to "improve" the Kansas River. On a smaller scale, the World's Fair committee paid workers to straighten and bury about a mile of the River des Peres, which meandered across the 1,300-acre fairgrounds. Some historians suggest that organizers diverted the stream underground, at least in part, to hide its embarrassingly polluted state and stench from World's Fair attendees.

Water pollution, in fact, had begun to penetrate the public consciousness by 1904. The passage of the 1899 Rivers and Harbors Act made it illegal to dump garbage and refuse into **U.S.** waters with-

out a **U.S.** Army Corps of Engineers permit, although this law was intended primarily to keep waterways clear for navigation.

High-profile water pollution concerns flowed into Missouri in 1900 after Chicago diverted its sewage into the Des Plaines River in an attempt to protect its **Lake Michigan** drinking water supply. The Des Plaines drained westward into the Mississippi, from which St. Louis drew its drinking **water**, albeit hundreds of miles downstream. St. Louis sued the state of Illinois but a judge dismissed the case, ruling that the sewage had been adequately diluted by the time it reached Missouri.

Trash and garbage plagued urban areas throughout the 19th century. Until cities actively intervened with sanitation rules, the accumulating solid waste spawned scavengers and unhealthy dumps. By the early **1900s**, cities had begun to experiment with new methods of handling refuse. A newspaper reporter noted that the high-tech garbage crematory at the World's Fair might also serve as an exhibit that could be "studied with profit by those municipalities who have wrestled with the vexed problem of how to dispose of a city's garbage."

(Below) Between 1914 and 1928, the Little River Drainage District built nearly 1,000 miles of ditches and over 300 miles of levees in the Missouri Bootheel. The project permanently transformed over 1 million acres of swamp into productive farmland. (Opposite page) The **Ozark Products Company**, Bellefountain, Mo., was known for its barite mining in the 1930s.



Some cities attempted to produce usable energy **by** burning wastes, but most of **these** facilities did not prove successful. Of 180 **refuse** furnaces installed between 1885 and 1908, 102 **were** abandoned by 1909 due to excessive operational costs and complaints of noxious smoke.

During that same period, Missouri's native forests, plants and animals also suffered. Grandin Mill, in its heyday, **the** largest sawmill in the United States, **de-**vooured some **70** acres of **Ozark** pines each day. In 1895, a Missouri fish commissioner lamented the depletion of the **state's** fish, **especially by** "trammel netters and dynamiters," still legal methods at the time. Despite declining fisheries, Missouri proudly displayed **some** of the state's unique species at the '04 World's Fair, including an "aquarium of blind fish taken from cave streams in the Ha Ha Tonka region," and "a

Kan. In Missouri, the **Walmsley** Fish and Game Law set up the **state's** first hunting licenses and banned the dynamiting of fish. These initiatives constituted the first important steps **on** a long journey leading to sweeping environmental measures of the late 20th century.

Missouri enjoyed a banner year in 1904, basking in the international spotlight as 20 million tourists visited the World's Fair—over 100,000 per day. The fair **showcased** both the creative genius of **man** and his unwitting but relentless exploitation of natural re-



Missouri State Archives photo

Grandin Mill, in its heyday, the largest sawmill in the United States, devoured some 70 acres of Ozark pines each day.


monster Mississippi River catfish, as large as an average-sized man."

With exploitive industries eyeing untouched resources on some of the nation's **most** pristine and beautiful lands, a few prominent citizens felt compelled to protest. One of them, President Theodore Roosevelt, delivered the keynote address at the dedication of the 1904 St. Louis World's Fair. A few years earlier, in his first message to Congress, Roosevelt argued strenuously for water and forest conservation. Subsequently, inspired by a camping trip to Yosemite with writer and preservationist John Muir, he expanded the national forest system. Roosevelt's predecessor, William McKinley, who **was** assassinated at the 1901 World's Fair in Buffalo, also supported an early conservation effort by signing the Lacey Act in 1900, prohibiting the interstate shipment of animals **protected by** state law. This act applied primarily to commercial plume harvesters, who killed thousands of birds such as egrets and spoonbills for their decorative feathers.

Momentum for conservation began to grow. In 1905, Congress established the nation's first wildlife refuge near Wichita,

sources. Fortunately, a gentle but persistent undercurrent of conservation and protection, not readily evident during the fair, had already taken hold by **then**.

The 1904 World's Fair highlighted, somewhat inadvertently, the growing list of environmental problems we would face in the next 100 years. Each scientific and technological innovation on display evoked a unique set of resource issues that would eventually have to **be** addressed. A clear connection had been drawn between environmental health and economic vitality.

One century later, we can clearly see the environmental gains we have made since 1904. But even while we celebrate our successes, we **must** strive to avoid the complacency that history has proven almost inevitable. Rather, remembering **how** far we have come should inspire us to do even more to protect our precious, and finite, natural resources. 

Loring Bullard, of Springfield, is director of the Watershed Committee of the Ozarks, a citizen-based organization dedicated to the protection of public drinking water sources for the city of Springfield and Greene County.

River Kids

by Bryan Hopkins
photographs by Scott Myers

The team of fourth-grade teachers at the New City School in St. Louis had been looking for a new nature-related study unit for their students. They found much of what they needed while attending a hands-on Big River educational workshop, sponsored by the Department of Natural Resources and Living Lands and Waters [<http://www.dnr.mo.gov/loac/river-cleanup.htm>].

A unit on rivers was right on track with their year-long fourth-grade theme of "Making a Difference." Information on community-based river cleanups, river history, river issues, tips on how to view their community from a watershed perspective and lesson plans were provided at the October 2004 workshop.

"We taught kids about the effects, and will, have on their rivers."

"We taught kids about the effects, good and bad, that people living in an **area can, and will, have** on their rivers," said **Ben Griffiths**, one of the **New City School** fourth-grade instructors.

Soon, Some of the students suggested that they could **form** an organization of their own – created for kids, **run** by kids. Several students gathered on their own time, during lunches and recess, to discuss the possibilities. The result was the birth of "River Kids." Aided by **support** from the dedicated staff at New City School, the enthusiastic fourth graders have been nothing short of amazing. **Tasks** such as fund raising, logo production, and activity planning have been distributed

among members. Meetings **were** arranged, often outside of class, to check progress, make decisions and plan for the future.

The River Kids have become involved in a **variety** of activities. **They** conducted a streambed cleanup of the local Deer Creek at a **Litzsinger Ecology** Center in Ladue, removing several industrial-sized garbage **bags** full of waste. A portion of the River Kids participated with their families in a local cleanup of the River Des **Peres**, hosted by the Green Center. The center, headquartered in University City, offers unique and diverse on-site demonstration grounds – gardens, wetlands and even a prairie. Visitors can wander the Green Center on their own, or take classes, offered throughout





(Left) **Dusty Reid**, the park superintendent for the department's newly acquired **Edward "Ted" and Pat Jones-Confluence** point State Park, explains the history of the new park and restoration plans for the day.

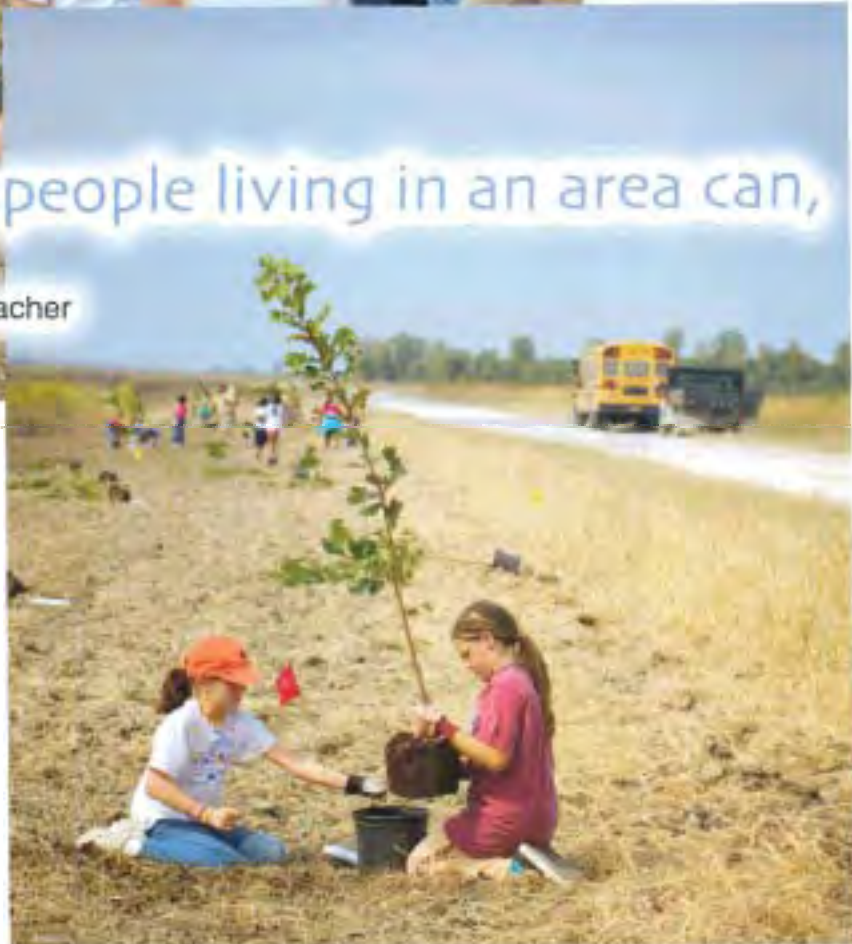
(Below) **Marlowe Lindsley** and **Rachel Puricelli** plant a tree at the park. By the end of the day, the **River Kids** had added 240 trees to the previously agricultural landscape. Their efforts are helping to restore the area where the muddy Missouri meets the mighty Mississippi.



the year. Call (314) 725-8314 or go to [www.thegreencenter.org],

The students also have installed sewer drain markers in their neighborhoods and distributed doorknob hangers with an explanation of the markers' purpose. They created a multimedia river educational presentation which was performed at the April 2004 St. Louis Earth Day festivities in Forest Park.

River Kids also participated in the "Run for the Rivers" as athletes or as event volunteers. The class attended a river education and cleanup event at the confluence of the Missouri River, sponsored by Missouri River Relief. They also participated in a tree planting at the department's new Ed-





ward "Ted" and Pat Jones-Confluence Point State Park. Six hundred trees were planted, helping restore the once agricultural floodplain to its natural state. Two-hundred forty-three of the **plantings** were handled entirely by the 50 students.

"Almost immediately after we began teaching our new unit, we began to feel that we'd stumbled onto something bigger and more important than what we initially **ex**pected ... we are **lucky** to teach such an impassioned group of students," **Griffiths** said.

The level of genuine interest in effecting positive change regarding Missouri's big rivers has been uplifting from a teacher's perspective and certainly promising, from an environmental perspective.

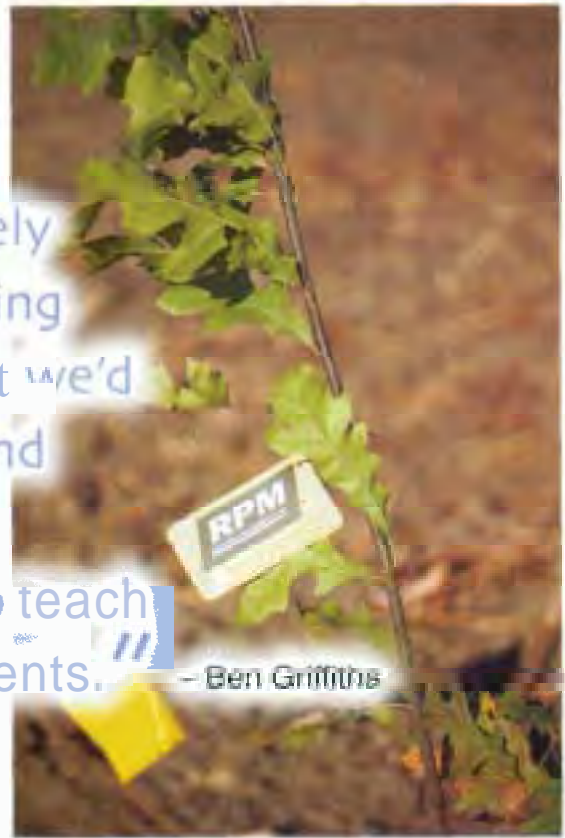
River Kids is a young organization, with much room to grow. Next year, the teachers at **New City Schools** are hoping to expand the program to other grades and help continue to turn these **kids'** dreams for cleaner rivers into reality. 🏡

Bryan Hopkins is an environmental education specialist with the department's Outreach and Assistance Center. Hopkins started the Big Rivers educational workshops.



"Almost immediately after we began teaching our new unit, we began to feel that we'd stumbled onto something bigger and more important than what we initially expected ... we are lucky to teach such an impassioned group of students."

- Ben Griffiths



(Opposite page, top) Ken McCarty, chief of natural resource management for the Division of State Parks, explains the vision for restoring the land at the new Edward "Ted" and Pat Jones-Confluence Point State Park. Students will be able to come back to the park as adults and know they had a direct hand in returning the area to a healthy bottomland forest ecosystem.

(Opposite page, bottom) The students participated in interpretive walks of the park and learned about watersheds and how they function.

(Above) The River Kids planted RPM (root propagation method) trees, which dramatically increase early growth and nut production.

(Below) Bryan Hopkins explains the importance of big river systems and how students can help to protect our rivers and their watersheds.





Lose That Lagoon

Modern Alternatives to Traditional Onsite Wastewater Systems

by Randall J. Miles

photographs by Scott Myers

An increasing number of Missouri citizens are moving out of the metropolitan areas and calling the urban-rural interface home. This growing "new rural generation," which desires to have a small acreage or a country estate, has been conditioned to believe that once their waste has been flushed, it is "out of sight, out of mind." State sources estimate that between 25 to 30 percent of existing Missouri resi-

dences are served by onsite wastewater systems (septic systems or lagoons).

Those statistics also indicate that nearly 50 percent of new home starts are using an onsite wastewater system as the new homeowners' preferred method of wastewater disposal and treatment.

These rising percentages are a result of drastically decreasing federal funding sources, which used to pay up to 80 percent of the construction of a municipal



sewer system. Larger lot sizes and the lower home densities in new suburban developments also make building and operating municipal sewer lines exceedingly expensive. Installing onsite wastewater systems in which the domestic wastewater stream is treated and disposed of on the lot can be a viable treatment alternative. These systems place greater emphasis on the soil plus the surface and groundwater sources of the area.

Among the main pollutants that these, or any wastewater system, should address is excessive nutrients. Nitrogen and phosphorus are two nutrients that can cause degradation of the eventual receiving waters if the system is not designed properly.

A key component in the design, construction, and operation of any onsite wastewater system is the soil resource in the receiving environment. A common onsite system used in many areas of Missouri is the conventional septic system (see page 12). This system uses a septic tank for primary treatment of the wastewater. The soil in the absorption field provides secondary treatment of the effluent before disposal into the environment and eventual entry into a surface or groundwater source. To properly treat the effluent, both the treatment unit and the soil must be compatible.

The role of the septic tank is to allow solids to settle out and fats, oils, and greases to be trapped at the top so that they do not reach the receiving environment. If quality treatment is the goal before the effluent enters the receiving waters, the septic tank will provide about 20 percent of the treatment with the soil providing the remaining 80 percent. For the soil to perform this level of treatment, it must be deep, well drained and permeable. It also must contain enough clay and organic matter to assist with proper purification of the effluent. The Menfro soil (see page 13) is an example of an ideal soil-receiving environment. It provides the needed secondary cleaning of the effluent before entering the receiving waters. Unfortunately, few Missouri soil resources contain the collective array of qualities that provide this needed level of treatment.

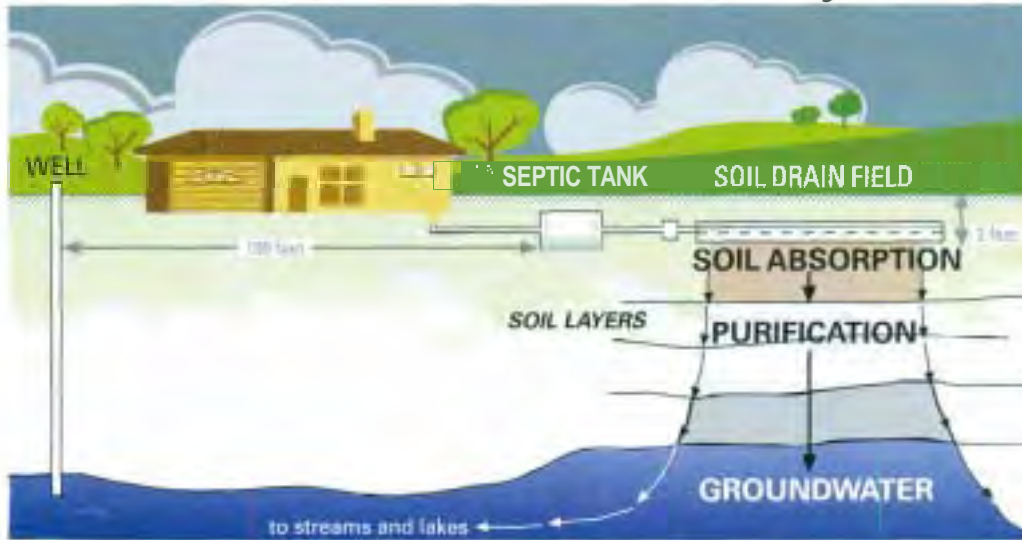
"Many parts of the state possess marginal soils which are shallow to bedrock, are made up of a slowly permeable layer, contain seasonally high water tables or are too gravelly or sandy to provide proper treat-



ment," said Scott Totten, director of the department's Water Protection and Soil Conservation Division. "Additionally, small lots, karst topography or poor planning make the situation even worse," he added. Accordingly, advanced secondary treatment and dispersal methods beyond the traditional septic system must be provided in these less than ideal receiving environments. Many technologies are available for homeowners and contractors to use to ensure adequate water treatment.

Under marginal receiving environments, one of the easiest methods to provide environmental protection is through the use of a secondary treatment unit. Most of these treatment units employ aeration to provide

Conventional Onsite Wastewater System



Cross-sectional diagram of a conventional onsite wastewater system in Missouri, which includes the septic tank, distribution box and layers of soil within the absorption field.

a fast, high-quality treatment of the effluent. The major technologies available are aeration treatment units (ATUs), sand filters and packed bed media filters. Described below, each of these technologies needs electricity and pumps to be effective. An ATU is similar to some types of small-

scale treatment plants. Most ATUs used in Missouri have three basic components: a "trash tank" (small septic tank) which provides settlement of solids and trapping of fats, oils, and greases; an aeration chamber that mixes the effluent and air in the center of the tank; and a settling chamber to reduce suspended solids before release of the effluent to the soil. Aeration systems provide good to very good quality wastewater treatment.

A sand filter is a confined bed of sand following a septic tank. In these types of systems, the tank wastewater is released to a "sand bed" via a timed pump. This produces a highly treated effluent for the marginal soil-receiving environment. This pulsing of the effluent through the sand media provides contact with aerobic bacteria in the sand bed. This is followed by a "resting" period, in which oxygen enters the media for the bacteria.

The Missouri Small Wastewater Flow Education and Research Center at the University of Missouri Bradford Research and Extension Center demonstrates various options for household sewage treatment.



"**This** treatment unit is a time-proven technology that has been used on larger volume wastewater flows with great success. These units can be constructed from local materials and are easy to maintain, relative to their level of sophistication," said **Totten**.

Packed bed media filters function in much the same manner as sand filters. They push primary-treated effluent through a porous media with the same resting period where oxygen enters to provide the aeration. Many types of materials can be used in the bed, such as peat, synthetic geotextile fabrics or synthetic foam cubes. These materials, like the sand in a sand filter, serve as the filter unit to host the aerobic bacteria which provide the secondary cleaning of the wastewater. These materials are not only porous but also require less area for the same quality of treatment as a sand filter. This leaves a smaller footprint on the residential lot – a prime consideration in many lakefront developments with small acreages.

Traditionally, most soil absorption fields use gravity as the major effluent distribution method in final release to the environment. Because of the home location and other cultural features on a site, often, only a fraction of the lot is suitable for the soil absorption field. One of the latest technological adaptations is the use of low-pressure distribution time-dosing to higher elevations of the tract. Drip irrigation tubing placed in the upper few inches of the surface soil is used in this method. The system creates a very clean effluent from an aerator, sand filter or a packed bed media filter. This process can use areas of the lot not available with gravity distribution. It "pulses" or "micro-doses" the effluent into a marginal soil receiving site where the use of a traditional on-site system would not be acceptable. These systems have the added benefit of irrigating the landscape where human contact is minimal.

In the past, homeowners and developers have considered the construction of onsite wastewater systems a temporary fix until a municipal system is built – perhaps many years later. However, with decreasing federal grants and the increasing lot sizes of many developments, onsite systems provide an environmentally friendly option.

"These systems do cost more than a traditional septic tank system, but for ade-

quate treatment, these additional features are needed for many parts of the state," **Totten** added.

As with large-scale municipal systems, operation and maintenance are critical to making individual onsite systems viable for the lifestyle that more and more Missourians are turning to when they inhabit the rural landscape.

Hopefully, when the new rural generation flushes, they will not be thinking that the waste is "out of sight, out of mind." Rather, it will be seen as an integral part of the landscape's water cycle. ☀️

Randall Miles is an associate professor of soil science at the University of Missouri Columbia. He specializes in soil morphology and management and is director of the Missouri Small Wastewater Flow Education and Research Center.



New Trail Opens at Table Rock State Park

Thanks to a cooperative effort by state and federal agencies and a private organization, visitors to Table Rock Lake have a new trail, The Table Rock Lakeshore Trail connects Table Rock State Park with the Dewey Short Visitor Center and White River Landing (home of the Showboat Branson Belle).



The trail is a cooperative effort by the Missouri Department of Natural Resources, the U.S. Army Corps of Engineers and the Herschend Family Entertainment Corporation. The spark that launched the effort was the Branson-based trail advocacy group called the Ozark Mountain Mature Trail Association. The two-mile paved trail also is open to motorized wheelchairs, bicycles, skateboards and scooters.

"This project is a good example of how public/private partnerships and cooperation between federal and state agencies can result in a new recreational opportunity for the public," said Doug Eiken, director of the department's Division of State Parks. "It also shows that private citizens can make a difference and that public agencies do respond to the needs of the public."

St. Louis Convention Center Cleanup Done

The Missouri Department of Natural Resources' Brownfields/Voluntary Cleanup Program (B/VCP) has issued a certificate of completion for the St. Louis Convention Center Hotel (Renaissance Grand Hotel) site in St. Louis for the cleanup of lead-based paint, asbestos and petroleum-contaminated soil.

Brownfields are abandoned or underused industrial or commercial sites, located primarily in urban areas, that are either contaminated or thought to be contaminated. Through the B/VCP, private parties agree to clean up a contaminated site and are offered

some protection from future state and federal enforcement action at the site in the form of a "No Further Action" letter or "Certificate of Completion" from the State of Missouri.

The St. Louis Convention Center Hotel (Renaissance Grand Hotel) started out as four separate parcels. The \$292 million project consisted of rehabilitating two former hotel buildings, the Statler Hotel and the Lennox Hotel, both of which are listed on the National Register of Historic Places; the construction of a 21-story hotel tower (the Grand Tower) connected to Statler; and the construction of a Conference Center/Ballroom and an 873-space Parking Garage facility.

The opening of the Renaissance Grand and Suites Hotel has created hundreds of local jobs and a new retail and entertainment area along Washington Avenue. This hotel is providing the catalyst for major economic development. The completion of the Renaissance Grand and Suites Hotel into the St. Louis Convention Center Hotel is an impressive tale of preserving a significant part of St. Louis history while cleaning up an environmental problem at the same time.

Renaissance Grand and Suites Hotel is the 2004 Phoenix Award winner for U.S. Environmental Protection Agency Region 7 and was the location of the 2004 National Brownfields Conference. For more information, call the Missouri Department of Natural Resources' B/VCP at 1-800-361-4827 or (573) 526-8913.

St. Joseph Water Company First MEMP Advanced Partner



The Missouri American Water Company (MAWC)

— St. Joseph Drinking Water Treatment Plant was recognized Nov. 10,

2004, as the first facility to

be accepted by the Department of Natural Resources for Advanced Partner membership in Missouri's Environmental Management Partnership (MEMP).

The partnership encourages organizations of any type or size to improve their environmental performances through an environmental management system (EMS). The partnership uses generally recognized EMS criteria, which include regulatory compliance and broader environmental goals.

An EMS is a process through which an organization determines activities, services or products that have an effect on the environment, then plans action to prevent or correct negative environmental effects and noncompliance.

The recognition ceremony took place at the treatment plant and included comments from Department of Natural Resources Director Steve Mahfood, MAWC Northwest Operations Manager Michael Gray, and MAWC Central Region Director Terry Gloriod.

"This facility is always looking for ways to do things better, and to make use of the most current technology, not only to serve its customers, but to serve all Missouri citizens by protecting the quality of the water we all share," Mahfood said.

Missouri American — St. Joseph District provides water service to customers in the city of St. Joseph, the village of Country Club and surrounding areas in Buchanan, Andrew and DeKalb counties in Missouri. Water also is sold to the cities of Elwood and Wathena, Kan. The plant meets stringent U.S. Environmental Protection Agency standards to remain in compliance with the Safe Drinking Water Act.

"(Their) decision to join the partnership as an Advanced Partner demonstrates a clear commitment to environmental protection," Mahfood said.

In addition to entering into this important partnership, staff there also regularly attend various forms of training offered through the Department of Natural Resources.

"Missouri American's decision to participate in this program is a classic example of the dedication our company has to making environmental management a fundamental part of our business," Gray said. For more information, contact the department's

Outreach and Assistance Center at 1-800-361-4827 or visit the department's Web site at: <http://www.dnr.mo.gov/oac/memp-ems.html>.

New Mountain View Wastewater Treatment Facility Up and Running

To start from scratch and have a new wastewater treatment facility built and in three years is quite an accomplishment.



But, that's just what happened when department staff from the Water Protection Program's financial assistance office met with Mountain View city officials in November 2000 to discuss their needs regarding funding for water, wastewater and storm water improvements. At that time, officials indicated that their current wastewater treatment plant was a continual cause for concern. Unfortunately, those worries became reality when the facility malfunctioned on July 5, 2001.

Roughly 50,000 gallons of partially treated wastewater threatened the Ozarks National Scenic Riverways and groundwater supplies in the area.

Although the city had applied for emergency funding from Department of Economic Development to work on their immediate problems, they were reluctant to pursue other department funding, citing the time delays involved. Natural Resources staff were quickly dispatched to explain options and clear up any misunderstandings about the time element involved.

Department staff took the lead and coordinated with all entities to insure that their short-term and long-term problems were resolved, according to Natural Resources Director Steve Mahfood. "I believe that this project has shown how quickly we can move when everyone works together. That includes city personnel, consultants, contractors and the Department of Natural Resources," he said.

environmental notes

Plastic Shopping Bags: Landfill Liabilities

What are we going to do about plastic shopping bags? Okay, besides the fact that they split wide open as soon as they sense the gallon of milk they are supporting is over a hard floor – they also are very tough to recycle.

Plastic shopping bags may cost less than a penny to produce, but they aren't as easy to dispose of as we might think. Some folks say it's time the bags were taxed – or even banned. According to ABC News, Americans use an estimated 14 billion plastic shopping bags every year, about 425 bags for every American. Many get balled up, stuffed under kitchen sinks and eventually go to landfills where they may take 10 to 20 years to decompose. Some sources say the heavier bags can take even longer.



While the thin plastic shopping bags contain little plastic resin per bag, their lightness and strength makes them vulnerable to winds that carry them across the countryside. There are some truly biodegradable plastic bags available now, but because they cost three to five times more than standard plastic bags, they're not a viable option so far. As long as plastic shopping bags are being used, please do what you can to use less of them. Take reusable cloth sacks or baskets on shopping trips. Some stores offer discounts if you bring your own shopping bags.

Whenever possible, reuse plastic bags until they are worn out, then dispose of them legally or recycle them. As plastic recycling guides explain, shopping bags are no. 4 or LDPE (low-density polyethylene). Call locally first, but at present there are recycling collections in Clark, Montgomery, Perry, Scotland, St. Francois and Webster Counties, Kansas City (Mallin Brothers Inc.) and St. Robert that take plastic shopping bags. Some larger retailers also will take back, and recycle, your plastic shopping bags. However, not all stores within a chain are able to participate at this time.

The city retained Scott Consulting Engineers to develop a facility plan and design the improvements. Officials also began educating residents about wastewater issues and problems. That hard work paid off when voters overwhelmingly approved a \$35 million bond issue on Nov. 6, 2001.

The Department of Natural Resources issued a construction permit on Nov. 21, 2002. The contract was awarded to McClanahan Construction and work began on Feb. 10, 2003. The new wastewater treatment plant was up and running on July 19, 2004.

"A large number of people played a significant role in the improvements at Mountain View," said Mahfood. "I think

it's important that we recognize and applaud their efforts."

Mountain View city staff who were instrumental in the project were City Administrator Tony Logue, City Clerk Lora Abbey and Arlin Ray, the new plant's operator. The consulting engineers were Mike Pessina and John Forrester of Scott Consulting.

Department staff from the Jefferson City central offices and Southeast Regional Office were involved from start to finish.

The Southeast Regional Office wastewater unit was responsible for the initial inspection after the July 5 incident. DNR staff conducted their final inspection of the new facility on Sept. 10, 2004.

Water Resources Law Annual Report Released In New Format

The Geological Survey and Resource Assessment Division released the Water Resources Law 2004



Annual Report in a concise and easy-to-read brochure. Links to Web pages providing in-depth analysis of the various subject matter are included.

The Missouri Water Resources Law (RSMo 640.400, sections 640.400 to

640.435) directs the Department of Natural Resources to ensure that the quality and quantity of water resources of the state are maintained at the highest level practicable to support present and future beneficial uses. The department is to inventory, monitor and protect the available water resources in order to maintain water quality, protect the public health, safety, and general and economic welfare.

The Water Resources Law 2004 Annual Report represents work completed by many of the department's divisions and programs. During 2003 and 2004, widespread interest and concern about water issues stimulated robust testimony around the state before the Missouri House of Representatives Interim Committee on Water

Quality Issues. The department has begun addressing many of the Interim Committee's recommendations pertinent to statutory responsibilities.

Many of the report's recommendations focus on appropriate water quality and quantity monitoring, proper waste disposal technologies, and a watershed approach to water resource planning and regulation.

The law in its entirety may be viewed online at [www.moga.state.mo.us/statutes/C640.html]. The Water Resources Law Annual Report may be viewed online at [www.dnr.mo.gov/geology/wrp/wr73.pdf].

For more information, contact the department's Water Resources Program at (573) 368-2175 or by e-mail at [mowaters@dnr.mo.gov].

I welcome and really appreciate your publications! In your *Missouri Resources* Fall 2004 edition, Vol. 21, No. 3, I noted with concern the two photographs in your very good article - "Earthquakes."

Both photographs showed each man working alone (other than the photographer) with: no safety helmet, ladder not braced, by a dirt wall, shoveling or scraping loose dirt, and no apparent safety measures being practiced by DNR staff.

These photographs, seen by many readers, young and old, & not appear to portray good safety measures. Perhaps this was not a major concern but the irony of the article title - "Earthquakes" - struck me.

Donald Price
St. Peters

Editor's Note:

The following is a very brief overview of a letter sent to Mr. Price by "Earthquakes" co-author Jim Palmer of the department's Geological Survey and Resource Assessment Division:

I appreciate your concerns for safety issues in our trenching photos. AS I was the other man, and in this case, also the photographer, it was difficult to illustrate that this was a two-man project. While it would appear to have been a risky setting, as is often the case, the picture does not fully express the entire situation and conditions.

Your comment concerning the trend shoring was well noted. In this particular instance, the materials encountered were stable, dry, cohesive, clay-rich soils. These were loess and Tertiary, or Cretaceous sediments, and not wet, sandy alluvium, or coarse-grained soils. The trenches themselves were

wide excavations, open on both ends. For the most part, they were open to the downhill side of the cut. In other words, most were cuts on sideslopes rather than two-sided trenches closed on the ends. Unfortunately, the photograph did not reflect the full extent of the site. The ladder was not braced & - cause it WAS not used it to get in or out of the trenches. Otherwise, as you correctly noted, it should have been.

The only loose materials in any the trenching exposures was spoil from the trackloader bucket used to dig the trenches. Concerning hard hats, I agree that we should have used pictures that showed us wearing O W hard hats and will do so in the future.

It is clear that you must have some experience with this type of work, and I do appreciate the opportunity to explain how we operated. are safety conscious and had we had more space, would have included more detailed captions to explain this. Thanks for taking the time to make us aware of your observations. Your comments remind us to better follow and portray safety efforts in the future.

Missouri Resources is filled with a wealth of informative material, and at a price most Missourians don't know of or wouldn't believe. If they did, I'm sure you would see a vast increase in your circulation. For me, the pictorial excellence offered serves as a window to the natural beauty and grace we Missourians are blessed to live in.

I hope to receive your next publication as a regular subscriber and thank you, in advance.

Richard Dowell, Jr.
Jefferson City

Letters intended for publication should be addressed to "Letters," *Missouri Resources*, P.O. Box 176, Jefferson City, MO 65102-0176 or faxed to (573) 751-8084, attention: "Letters." Please include your name, address and daytime phone number. Space may require us to edit your letter. You also can e-mail *Missouri Resources* staff at moresdnr@dnr.mo.gov



New Sand and Gravel Rules Protect Water Quality

The Missouri Department of Natural Resources will use new mining rules for sand and gravel mining. The department's



Land Reclamation Program is responsible for permitting and inspecting operators throughout the life of their mining activities. While there is some disagreement about whether such mining in Missouri streams should be allowed, there is consensus among industry and environmental groups that fair and consistent standards are needed.

"The purpose of these new rules is to set standards to protect Missouri streams while allowing the extraction of sand and gravel resources from the stream environment," said Steve Mahfood, Natural Resources director.

The new rule requires that operators stay out of the flowing water of a stream to protect aquatic life and requires that stream dynamics not be altered. It also requires that the protective bank vegetation be left intact. This limits erosion during high water events.

Commercial operators who extract and sell sand and gravel will be subject to this rulemaking. Private landowners that mine these products for personal use are exempt from the law. Two other exemptions include the military and any political subdivision. These exemptions allow sand and gravel mining without a permit, and without regulatory review. As each permit is renewed or issued over the next 12 months, the new standards will be incorporated into the permit.

The Land Reclamation Commission appointed a 44-member workgroup to draft these standards. The workgroup included representatives from industry, concerned environmental organizations, public citizens, members of the legislature and staff, representatives of public agencies, local governments and landowners. These standards became effective Oct. 1, 2004.

For more information on the new sand and gravel rules, contact the department's Land Reclamation Program at 1-800-361-4827 or (573) 751-4041.

Osage Indian Exhibit Open at Arrow Rock

A major new exhibit on the Osage Indian nation is on display at the Arrow Rock State Historic Site in Arrow Rock. "The Osages at Home in the Center of the Earth" exhibit will be on display through June 26, 2005. The exhibit is provided by the Osage Tribal Museum, which is America's oldest tribally owned museum and located in Pawhuska, Okla. The Osage were the predominant Native American tribe in the area of present-day Missouri, southwest Kansas, Oklahoma and northwest Arkansas during the early 19th century. Their story will be told through objects such as the shield of Chief Black Dog, a woman's wedding coat, toys and examples of exquisite beadwork.

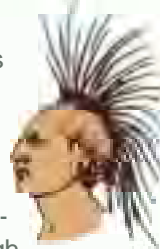


Exhibit hours will be from 10 a.m. to 4 p.m. on Friday through Sunday and on holiday Mondays through February. From March through June, the exhibit will be open daily. The 10-minute film "Journey of the Osage," produced by the St. Louis Art Museum, also will be available for viewing.

Arrow Rock State Historic Site is located 13 miles north of Interstate 70 on Highway 41 in Saline County. For more information, contact the site directly at (660) 837-3330 or the Department of Natural Resources toll free at 1-800-334-6946 (voice) or 1-800-379-2419 (Telecommunications Device for the Deaf).

Children's Garden to Open at Botanical Garden

The Missouri Botanical Garden has contracted with J.A. Wachter Builders of St. Louis for the construction of its new Doris I. Schnuck Children's Garden, scheduled to open in late summer 2005.



The theme of the two-acre Children's Garden is "A Missouri Adventure in the 1800s." The \$5 million project involves complex site work consisting of extensive underground utilities, grading and structural concrete piling. The firm has completed similar major site work projects but none have been as extensive or unique, said John Wachter, president. "We are honored to be a part of such a unique and important project for the Missouri Botanical Garden and the City of St. Louis," he added.

The new garden will feature a man-made cave, a working river, wetlands and a family plot of extinct species' "graves." Structures will include an old town square with a jail, general store and town hall. As children play they will learn about plants, nature and 19th century Missouri history. Native plants will be used throughout the landscape.

The design incorporates Missouri Botanical Garden founder Henry Shaw's original Usage Orange trees into its central feature, a "Canopy Climb" that will provide an elevated retreat of treetop boardwalks and a tree house. "All of the site work has to be performed on a very tight site without damage to existing trees that were planted by Henry Shaw over 100 years ago," said Wachter.

The children of the Donald Schnuck family provided the lead gift to name the new Children's Garden in honor of their mother, Doris I. Schnuck.

The new Children's Garden supports the Missouri Botanical Garden's mission "to discover and share knowledge about plants and their environment, in order to preserve and enrich life." Today, 145 years after opening, the Missouri Botanical Garden is a National Historic Landmark, a center for research, education and horticultural display and winner of the Horticulture Magazine and American Association of Botanical Gardens and Arboreta "Garden of Excellence" Award for 2004.

TIME EXPOSURES

Send your photo to "Time Exposures," c/o Missouri Resources, P.O. 176, Jefferson City, MO 65102-0176. All pictures will be returned via Insured Pre-1970 environmental and natural resource photos from Missouri will be considered. Please try to include the date and location of the picture, a brief description and any related historic details that might be of interest to our readers.



Ferry crossings, like this one across the Osage River, were once common in Missouri. This photograph, taken by Otto Kroeger in the early 1900s, captures the waning days of Huber's Ferry on the Osage River. As travelers wait for the ferry in the foreground, construction barges can be seen behind the ferry. Workers were building the first bridge to connect Cole and Osage counties. On the bluff across the river, the Huber House, a well-known landmark along Highway 50, towers above the Osage. The Huber House is part of the Huber's Ferry Farmstead Historic District, which was listed in the National Register of Historic Places in 1999.

Discovery Center Museum to Go Green in Springfield

The Discovery Center of Springfield (DCS), an



interactive, hands-on museum designed to inspire lifelong learning, broke ground on Missouri's newest green project in fall 2004. The new addition is designed to achieve Leadership in Energy and Environmental Design (LEED™) certification. LEED™ certification, administered by the U.S. Green Building Council, rates projects based on: site sustainability, energy and atmosphere, indoor environmental quality, material and resources, and water efficiency.

The 30,454 square foot expansion will rely on high performance and sustainable design standards to decrease the center's annual operating costs by reducing its consumption of water and

energy. The building, designed by H Design Group of Springfield, will minimize the building's impact on the environment. It also is designed to serve as a living laboratory for visitors by providing a high-profile demonstration of green buildings and their benefits. The Discovery Center currently houses 30,000 square feet of interactive exhibits and is planning to double this space with its new addition.

"The Board of Directors and staff are 100 percent committed to this process," said Emily Fox, DCS CEO.

*Hiring Jason Hainline of EMSI, also of Springfield, as our green building consultant added a new level of understanding and commitment for us. We are looking forward to developing and creating exhibits to highlight the 'green building' features in order to educate the public on sustainable building."

Staff from the Missouri Department of Natural Resources have participated as team members in this project to

help provide technical expertise on energy efficiency. A recent \$225,000 grant from the C.W. Tiues Foundation, as well as many other contributions, are helping make this project a reality. The DCS is still accepting donations for the additional \$375,000 to \$400,000 still needed to fund the construction portion of the project. For information on donating cash or construction resources, e-mail Emily Fox at [efox@discoverycenter.org] or call (417) 862-9910 ext. 700.

Specific traveling exhibits are brought in two to three times per year to keep the DCS environment fresh and exciting for visitors. For more information, visit the DCS Web site at [www.discoverycenter.org].

For news releases on the Web, visit [www.dnr.mo.gov/newsrel]. For a complete listing of the department's upcoming meetings, hearings and events, visit the department's online calendar at [www.dnr.mo.gov/oac/calendar.htm].

Watershed Committee of the Ozarks Greene County's Drinking Water in Good Hands

The Watershed Committee of the Ozarks (WCO) was formed in 1984 as a partnership between the city of Springfield, Greene County and City Utilities of Springfield. The chairman of the Springfield Board of Public Utilities, N.L. "Mac" McCartney, with the consent of then-mayor Harry Strawn, appointed a task force to protect the surface and sub-surface watersheds of the area. The timing couldn't have been better as the Springfield area has been growing like a weed ever since. The citizen-based WCO has worked for more than 20 years to continue to raise awareness and protect the drinking water supplies for Greene County residents. Many of the WCO's successful programs, like the "Show Me Clean Yards and Neighborhoods," Valley Mill Lake Recreation and Learning Center, and exhibits at the Springfield Discovery Center have been replicated in other cities across the state. The committee also has developed an inventory of karst features in Greene County and incorporated the data into a geographic information system. The unique karst topography is subject to pollution from various sources that cannot be easily corrected.



The WCO at work

The group has organized regional conferences that bring businesses, citizens and professionals together to discuss watershed management from a diverse perspective. This inclusiveness has made the brokering of water and pollution-issue agreements between local and state government, and private entities easier to accomplish. A protocol for responding to area pollution spills and Best Management Practices (BMPs) tailored to and approved by local agricultural producers and land developers are just two examples of their cooperative efforts. The WCO also has developed plans and raised funding for the Watershed Learning Center, which will be a premier education and demonstration facility at Valley Water Mill. The group's 2003 annual report listed the WCO and its various committees responsible for the managing of 21 active grants that include a total funding of nearly \$3.25 million.

The grassroots WCO has been widely honored and recognized for its dedication to protecting Springfield's water resources. In 2000, they received the Governor's Pollution Prevention Award for using innovative source water protection techniques in the development of a residential subdivision in the Fulbright Spring Recharge Area. In 2003, the WCO was honored at the national Groundwater Foundation's 19th annual conference in Las Vegas.

The 2003 board members were Jan Wooten, Dave Sturdevant, Gene Croy, Mark McNay, Stuart Wetzel and Randy Ebrite. Assisting were staff director Loring Bullard, Adam Coulter, Stephen Van Rhein, Jan Blue and Dave White. New 2004 board members are Sharon Faulkner, Chris Coulter and Dan Chiles. Matt Keener and Stacey Armstrong are new 2004 staff assistants.

The Watershed Committee of the Ozarks is still sponsored by City Utilities, the City of Springfield and Green County, the original entities that cemented this highly beneficial partnership. For more information, access the group's Web site at [www.watershedcommittee.org/committee.htm].

Barbara Lucks Embodies Springfield's Progressive Label

If the city of Springfield had its own dictionary, you could look up the word involvement and find a picture of Barbara Lucks. Employed by the city's public works department, she is recycling coordinator, materials/recovery coordinator, and acknowledged environmental spokesperson for all things green. Lucks also is the most visible representative of the area's chapter of Choose Environmental Excellence (CEE). Being at the forefront of Greene County's CEE efforts, Lucks is more often working to garner recognition for others that work so hard toward the organization's goals. In 2004, she even individually sponsored a CEE award, as did the solid waste district, Ozark Greenways Inc., the Springfield Area Chamber of Commerce and the Watershed Committee of the Ozarks. She also serves on the Watershed Committee of the Ozarks' Watershed Center Task Force. The group has been gathering funding for a learning and demonstration center that focuses on watersheds. The complex watersheds of the area are faced with water quality and quantity issues due to growth.



Barbara Lucks

Among Lucks' many day-to-day duties as an employee of the city is her continued efforts on behalf of Springfield's widely respected recycling programs. For example, as with many cities, the growing problem of what to do with waste glass is a major concern to Springfield. Unrecycled glass not only takes up tremendous landfill space, it obviously is not biodegradable. Cities that do not have able recycling programs for glass are left with either sending it to the landfill, or paying to have it shipped off for recycling. Lucks, like other city officials have spent considerable time exploring options and remedying the city's growing mountains of glass.

According to Lucks, the city's four recycling centers generate a total of about 375 tons of glass per year. With no local market for it, Springfield spends about \$23,000 a year sending it to recyclers in St. Louis and Oklahoma. A new contract proposed by the city council would hire APAC-Missouri to bring in portable crushers once a year and process a minimum of 1,000 tons. Efforts by Lucks and others have encouraged segments in the city who currently throw away their glass, to consider joining the effort. Even with increased participation, it will take more glass to cover the contract's requirements. The city plans to make up that deficit by asking other cities, recyclers and waste haulers to bring their glass to Springfield for processing. Besides generating a usable product for glass recyclers, some of the product would go back work at home through city paving projects. Crushed glass makes a suitable substitute for the rock aggregate used in the underlayer and can be used in the sub-base mix as well. "Glasphalt" already has been successfully used in two city projects. Contractors will be required to use the material on street projects, saving money over quarried rock.

Progressive leaders like Barb Lucks and officials with the city of Springfield have laid the plans for yet another cost-saving, environmentally sound project that will directly benefit both the city and potentially, other southwest Missouri communities.

Once again, Greene County lives up to its name.

Resources To Explore

Castlewood State Park

by Richard Love

photographs by Scott Myers



The Castlewood area on the **Meramec** River has come full circle through the years. Where grandma and grandpa used to swim at Lincoln Beach and dance at clubs, now grandsons and granddaughters hike on trails and commune with nature. What was once a private playground for citizens from the city of St. Louis is now Castlewood State Park, a recreation and nature area available to everyone. The **Meramec** River has long conjured images of

play, rest and beauty for St. Louis area residents. The Castlewood resort area on the river flourished from 1915 to 1940. The Missouri Pacific Railroad would deliver travelers to the Castlewood depot at the base of a large bluff. Fun seekers would then climb the Grand Staircase, still located within Castlewood State Park, to the top of the bluff and then down paths to the many clubhouses, hotels and stores that dotted the landscape.

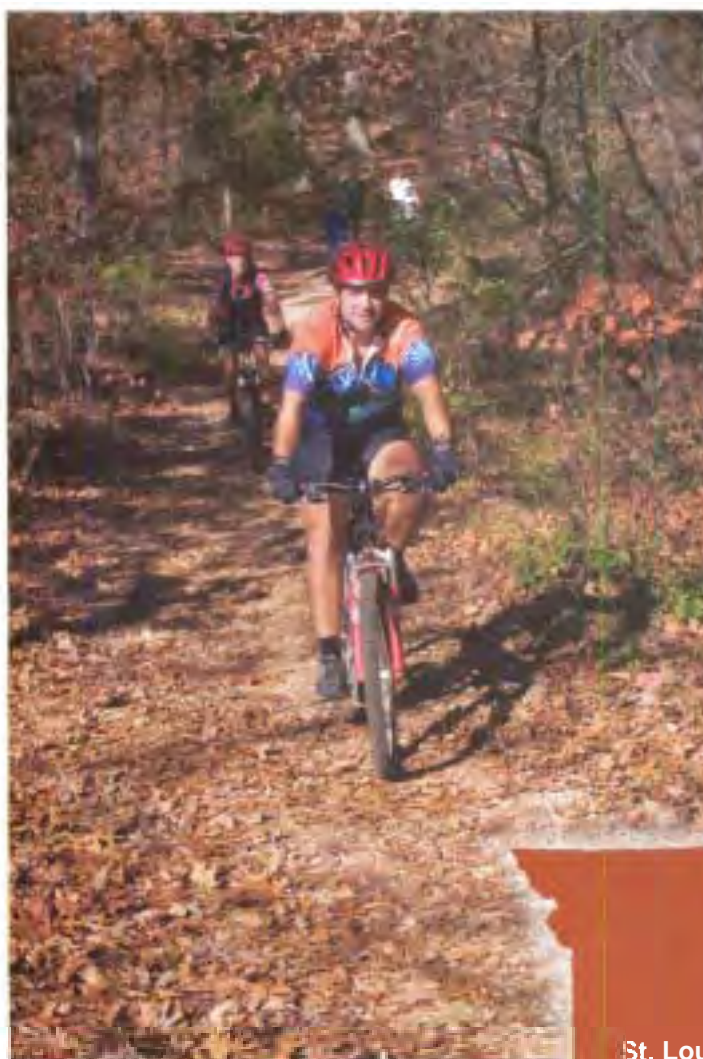
The big attraction was a large sandbar known as Lincoln Beach. Days were spent on fun activities in the water. Nights were

spent on clubhouse partying or dancing at open-air dance floors. Old timers say **the** beach attracted as many as 10,000 people on weekends at the peak of its popularity.

The attendance at Lincoln Beach, Castlewood and the Meramec River waned during the post World War II years. Cars replaced **trains** as the **main** mode of transportation and travelers sought out more distant areas. Castlewood became a quiet place, part residential area and part hunting and fishing camp. Some clubhouses were renovated for year round use, **others were** demolished and many were left to **decay**. In 1973, after **par s** of decline, large parcels of the **Castlewood** area went up for sale. The driving force in the purchase of the **lands** that comprise the **park was** the need for open space in the greater St. Louis area. A citizen conservation group, the Open Space Council, provided leadership and a sizeable donation that was **key** to the acquisition of the land by the Missouri Department of Natural Resources between 1974 and 1980. The park **was** officially dedicated on **Oct. 21, 1979**. Castlewood **State Park** then became the centerpiece for the **Meramec** River Recreation Association (**MRRA**), a not-for-profit organization established in 1975 for the **protection and** preservation of the river corridor.

Although picnicking has replaced clubhouse partying and the resorts and clubhouses have vanished, the natural beauty of the **area** and access to the **Meramec** River remain, continuing **Castlewood State Park's** recreational appeal and popularity to present-day visitors. Anglers are still able to find **numerous spots to fish for bass, catfish, carp, drum and bluegill along five** miles of river frontage. There is a walk **in/carry** in river access for launching canoes, **kayaks** and small johnboats. Attractive to families because of its 50 picnic sites and playground, the park also can accommodate larger groups. Its two picnic shelters can be reserved for a fee by contacting the park office.

The number of trails at the **park** make hiking still the **best way** to get around unless you have your mountain bike or trusty steed. **There** are 23 miles of multi-use trails that transport visitors to different outdoor worlds, whether on foot, on a bicycle or on a horse. The River Scene Trail takes visitors along limestone bluffs towering above the Meramec River, offering panoramic views of the river valley and bottomland



St. Louis County

forest below. In the floodplains adjacent to the river, a mixture of bottomland forest **dominated** by large sycamores and cottonwoods mixes with open areas covered by huge patches of spring wildflowers such as bluebells; the Stinging Nettle Trail loops through this area. At the center of the park is the spring-fed Kiefer Creek. Sections of Kiefer Creek are paralleled by the **Grot-peter** and Lone Wolf trails. The creek meanders through meadows between rolling hills topped by a hardwood forest of oak and hickory. Throughout the park, wildlife abounds, including white-tailed deer, coyote, beaver, raccoon and birds such as kingfisher, **turkey** and great blue heron.

Future plans for Castlewood State Park include expanded trail development. The park is part of a larger effort to provide a series of interconnecting trails along the entire length of the Meramec River corridor. As part of this effort, new trails at the park, **when** completed, will link **Castlewood** with other **park** areas within the **Mer-**

(Opposite page, top and Inset) The Lone Wolf trail in Castlewood State Park offers majestic views of the Meramec River valley. However, guests are encouraged to be cautious while taking in the view.

(Above) With its extensive trails system, Castlewood State Park is very popular with mountain bikers like Ken DeBeer of St. Peters. There are 23 miles of multi-use trails within the park.

amec Greenway. The first link was realized with the completion of the 2.5-mile A1 Foster Trail. The trailhead is located on Grand Avenue in the city of Wildwood near the intersection of Highway 109 and Old State Road; the trail follows an abandoned railroad bed that parallels the Meramec River through Castlewood State Park and Sherman Beach County Park. The A1 Foster Trail was developed through a cooperative endeavor with the city of Wildwood, the Department of Natural Resources, St. Louis County Parks, the Meramec River

or Ries Roads from Manchester Road, and is open daily from 7 a.m. to half an hour after sunset.

For more information contact the park office at 636-227-4433 or call the Department of Natural Resources toll free at 1-800-334-6946 (voice), or 1-800-379-2419 (Telecommunications Device for the Deaf). Information can also be found at the Web at [www.mostateparks.com].

Richard Love is the park superintendent at Castlewood State Park.



(Above) The Meramec River, which runs through Castlewood State Park, continues to serve as a recreational resource for canoeists, kayakers and fishermen. **(Right)** James Wu and Grace Lin, visiting artists from Taiwan, enjoy the panoramic view from one of the park's limestone blufftop overlooks.

Recreation Association and The Great Rivers Greenway District.

Whether you like looking at the remnants of the past, escaping the bustle of modern life, giving yourself a workout or viewing nature and all of its wonders, Castlewood State Park can accommodate you and whatever activity you should choose.

The park has 1,779 acres available and is located at the intersection of Kiefer Creek Road and Ries Road in West St. Louis County. Castlewood State Park can be reached via Big Bend Road from Highway 141 or via Riefer Creek





Career Connection

Net Gains

Web Maintainer is a Designing Woman

by Candy Schilling
photographs by Scott Myers



Mention the words, "computer-savvy technophile" and the first image that springs to mind might be a young male with poor eyesight and even poorer people skills. Fortunately, those stereotypes are fading fast in today's computer-dependent society and workplace. The Department of Natural Resources is no exception. There are 74 computer-related positions scattered throughout the department. Of those, 33 are filled by women.

Laura Teasley is a Computer Information Technologist III (CIT III) in the Water Protection Program. She started out with the department nearly eight years ago as an account clerk in the Nonpoint Source

of the program's planning section. When Teasley's three daughters were in grade school, she decided it was time she went back to school herself. Although she chose a program that allowed her to study both computers and accounting, she still wasn't sure which career path to pursue.

Both professions demand close attention to detail and can be very challenging. "Even though I enjoyed the accounting, it wasn't long before I knew that computers were what I wanted to do in the long term," said Teasley.

Fortunately for her, the decision to work for state government was an easy one. "It's provided me with a steady job that has se-

As a computer Information **technologist** in the department's Water Protection Program, **Laura Teasley** helps design and maintain the program's **Web** pages.



Laura Teasley spends much of her time developing and maintaining Intranet and Web pages for the Water Pollution Control Program.

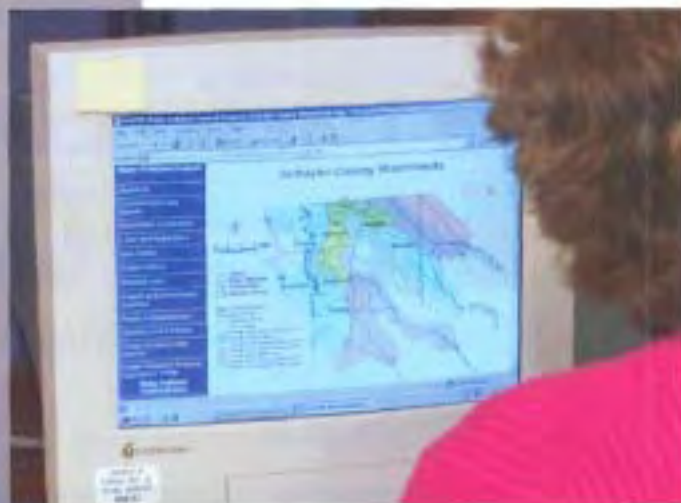
As a computer tech, she knows her way around the inside of a computer, as well. (Above right) DNR staff and the general public make good use of her online handiwork, such as this Schuyler County watershed map. Learn more about the status of water quality in the state by visiting [www.dnr.mo.gov/wpscd/wpcp/index.html].

curity, benefits and the flexibility to take care of my family."

Many people view their work at the department as more than just a job. They believe that what they do helps the environment as well. They feel, regardless of the job description, the work seems more satisfying than punching a clock in the private sector. While **Teasley** was working for the Nonpoint Source Unit, going along on site visits was one of her favorite parts of the job. "When we visited these communities and talked with people, I could see for myself that what we were doing was making a difference," **Teasley** said. She laughs when she recalls the first time someone mentioned a watershed. "I was thinking that it actually had something to do with a shed. Boy, have I learned a lot since then." For the record, a watershed is an area of land that drains into low-lying bodies of water. Watersheds come in all sizes, from millions of square miles to just a few acres.

"I don't have a science background, but I believe that my learning experiences here give me some insight into what kind of information people may be interested in. What kinds of questions they ask. I like to use the Web to give them those answers," **Teasley** said.

A bachelor's degree or an associate of arts degree with at least 15 semester credit hours in computer science is required to become a computer information technolo-



gist trainee. Four years of advanced clerical or technical experience with an agency may be substituted on a year-for-year basis. "Once you're a trainee, each year of experience makes you eligible for the next step up," said **Teasley**.

Teasley says there isn't anything routine about her job. "I deal with different kinds of issues on a daily basis." When she started with the department, most of her time was spent on end-user support. Now, most of her time is spent on designing and developing the Web and **Intranet** pages. "I still help out with the end-user support, just not as much," she said.

According to **Teasley**, past and present supervisors and upper management have supported and encouraged her to take the training and courses to do her job effectively. But, they're not the only ones to lend a hand. "You also have all of the computer support staff throughout the department to ask for help. If I have an issue that's never come across my desk before, you can almost bet that someone else in the department has. All I have to do is pick up the phone or send out an e-mail. They are very willing to help you out," she said.

Teasley says many opportunities for professional growth exist within the department. "I started out as an account clerk, processing payments. Through that experience and taking college courses, I became eligible for the CIT trainee position. As I gained experience, I was able to work my way up to a CIT III. The opportunities are there. I'm a perfect example."

Candy Schilling is a public information specialist with the department's Water Protection and Soil Conservation Division.



A Vote for Accountability

by **Stuart Westmoreland** and **Kathy Deters**



Through the parks-and-soils sales tax, our state park system is operated and soil and water resources are protected.

During the 2005 legislative session, Missouri's legislators may have the opportunity to address an issue that will benefit all Missourians by assisting the state park system and efforts to control soil erosion. The parks-and-soils tax is a one-tenth-of-one-percent tax that serves as the primary funding source for the state park system and the prevention of soil erosion. Neither of these programs receive any general revenue. The tax was first passed by Missouri voters in 1984. Since then, it has been renewed twice, in 1988 and in 1996, by almost two-thirds majority vote, which is remarkable for a tax vote put to the people. The tax is divided equally between the state park system and efforts to stop soil erosion, and both missions fall within the Missouri Department of Natural Resources.

This tax will expire 2008 unless it is reauthorized by Missouri voters. It is anticipated that a bill to place this tax on the 2006 ballot will be introduced this legislative session. The bill is expected to ask Missouri voters to decide if they want to extend the tax for another 10 years.

The department has made it a 2005 legislative priority to guarantee that Missourians can vote on the parks-and-soils sales tax every 10 years.

The department does not, however, support making the tax permanent. We believe Missouri citizens have the right to decide whether their taxes are being used as promised. The department is pleased that Missourians recognize the successes of these efforts. By demonstrating long-term accountability, it is the department's hope that Missourians will continue to vote and affirm their confidence in this small but critical tax.

The agency's Division of State Parks uses this tax to develop and operate its facilities, including campgrounds. The department's priority is to continue to adequately maintain the existing state park system and to provide a quality service to every park visitor.

The parks that this tax funds also benefit nearly every Missourian. They provide a healthy, inexpensive recreational opportunity while preserving and protecting natural and cultural resources. A recent University of Missouri-Columbia study also found that these parks contribute hundreds of millions of dollars to Missouri's economy each year.

The other half of the tax is crucial to protecting Missouri's environment. Through soil conservation measures, we are keeping the soil on the land

where it can support crops and all living things. Keeping soil out of our water also protects the quality of the water that we use for drinking, swimming, fishing and boating. It keeps harmful pesticides out of this water and helps protect the wildlife that Missouri's rivers, lakes and streams support. Without this tax, the outstanding progress made by Missouri's soil and water districts would be crippled. Most of the money dedicated to soil and water conservation efforts in Missouri come from the parks-and-soils sales tax, although some federal funding also is available.

Citizen groups have been actively supporting the placement of this sales tax on the 2006 general election ballot, either through a legislative proposal or through an initiative petition campaign. If the tax is not renewed, alternative funding sources will need to be found or drastic operational changes will be needed for both the state park system and the program to control soil erosion.

Kathy Deters is a public information coordinator with the department's Outreach and Assistance Center. Stuart Westmoreland is a public information administrator with the center and editor of Missouri Resources.



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